WEATHER IN THE UNITED STATES

THE WEATHER ELEMENTS

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GENERAL SUMMARY

September was abnormally warm—generally 4° to 10° above normal—east of the Rocky Mountains except in some extreme northeast and southern localities where the monthly averages were near the normal. West of the Rocky Mountains the temperatures were slightly above normal, except at a few stations in the Pacific coast districts which reported small deficiencies. Considering the entire country, it was the warmest September of record. Previous maxima for September were equaled or broken in many places from the northern Great Plains eastward, 104° being reported as far north as Minneapolis.

The monthly precipitation was very unequally distributed. More than normal was received north of the Ohio and lower Missouri Rivers, some sections receiving 100 per cent above normal for September. Large excesses above normal likewise occurred in portions of the Rocky Mountains area, the Pacific Northwest, and in southern Florida. Elsewhere there was a general deficiency. A large portion of the lower Mississippi Valley and much of the Southwest received less than 25 per cent of the normal, and the deficiencies were nearly as marked in the South Atlantic, western Great Plains, and central Pacific areas.

TEMPERATURE

The first week of September was warmer than normal in most portions of the country, particularly in the Plains States and the northern half of the Rocky Mountain region. Large portions of the Ohio Valley and the lower Lake region had practically normal temperatures this week. The fortnight from the 8th to the 21st was remarkably warm for September from the interior of the Middle Atlantic States westward and southwestward to the upper Mississippi Valley and the middle and southern Plains, and also moderately warmer than normal in New England, the South, the Dakotas, and most portions of the Rocky Mountain States, save Montana. In the far West this period was generally cooler than normal.

From the 22d temperatures generally were lower than they had been during the previous two weeks, the change progressing from the Northwest into the East and South, where some States had three or four days at the end of the month with temperatures lower than normal. The final 9-day period averaged cooler than normal in most north-central and northwestern areas, but warmer over much more than half the country; though the departure was generally small except from the lower Mississippi Valley westward to southern California, where it was usually +3° to +9°.

The month as a whole was probably the warmest September in the history of the weather service. From Colorado eastward to the Middle Atlantic States many States and numerous single stations report it the hottest September within the period available for computation, which is usually from 35 to 50 years. From South Dakota to Oklahoma the month averaged 7° to 9° hotter than normal, and practically everywhere else east of the Rocky Mountains from 3° to 6° hotter, save in much of Florida, New Hampshire and Maine where it was only about normal. Generally in Arizona, Utah, Idaho, Washington, and western Montana the month averaged a little warmer than normal, but in Nevada, southern Oregon, and northern and central California a little cooler.

The highest marks were 100° or above in most States, and in some eastern cotton States even 106° or 107°. Minnesota and several Plains States reported from 110° to 112°, but the very highest was 115° at Gila Bend, Ariz., on the 11th and again on the 28th. In the western half the highest readings occurred generally during the opening week, but in the eastern half either about the 11th or about the 18th. From Montana eastward to New England several stations noted marks higher than any of previous September record.

The lowest readings in some Gulf States were above 40°, but in other States east of the Rocky Mountains between 40° and 25°. In the far West many high mountain stations reported lower temperatures, 8° being noted at a Wyoming station on the 23d. Lowest marks occurred largely about the 9th or about the 23d in the western half of the country, but in the eastern half usually during the final four days.

PRECIPITATION

The first week in September brought heavy rains to parts of the Florida Peninsula and to western Washington, most of the central valleys, the Ohio Valley, and large portions of New York and New England. The second week was mainly a period of little or no rainfall, though much of Florida and Michigan received considerable. The third week brought needed rains from northern Oklahoma and the eastern parts of Kansas and Nebraska northeastward to northern Michigan, also to northern New England and New York, and a large part of North Dakota.

The final 9-day period of the month was the time of best-distributed rainfall for the northern and central sections east of the Rocky Mountains, though there was heavy rainfall over most of Iowa and northern Missouri and the southwestern part of Wisconsin.

The distribution of the monthly precipitation was uneven and was notably scanty in nearly all of the South and a large part of the Plains. In Florida the situation was particularly diverse, Miami having the wettest September of record, while Jacksonville had the driest.

From South Carolina, Georgia, and northern Florida westward to include Arkansas and Louisiana there was very little rainfall and little also in southern and western Texas, and thence northward over the western Plains to the Black Hills area.

There was mainly much less rainfall than normal in southern Virginia and from New Jersey to Massachusetts.

More than normal rainfall occurred in the southern half of Florida, Miami measuring 19.70 inches. The Lake region received considerably more than normal and the Ohio Valley, somewhat more than normal, save the southwestern portion. Most of the upper Mississippi and lower Missouri Valleys had considerably more than normal, one Iowa station reporting 12.68 inches. From northern New Mexico to northwestern Montana the vicinity of the Continental Divide had usually more precipitation than normal, and the northern and western portions of Washington also had more than normal, one station in western Washington measuring 16.32 inches.

Several Western States report appreciable snowfall in their high mountain areas. Most of this snow occurred not long before the end of the month.

SUNSHINE AND RELATIVE HUMIDITY

More than the average amount of sunshine was received generally throughout the country during September, except in the far Northwest, much of the Lake region, northern New England, and southern Florida, where less than the usual amount prevailed. It was particularly large in the south-central Great Plains and eastward to the Atlantic. In the southern portion of the Florida Peninsula the daytime sky was only 27 per cent clear, while in some sections of the northern portion of that State it was 70 per cent clear.

The relative humidity was above normal in the Ohio Valley, the Lake region, the far Southwest and southern Florida. Elsewhere, it was generally below the average, with departures mostly small, except in the central Great Plains where they were rather pronounced.

SEVERE LOCAL STORMS, SEPTEMBER, 1931

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path (yards)	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Eureka, Mo., and vicinity	1	5:15 p m	100		$25,000	Tornado	Buildings and other property damaged; 5 persons injured; path 1 mile long.	Official, U. S. Weather Bureau.
Knoxville, Tenn	2	2:29 p. m.			2,000	Thunderstorm	Tower destroyed by lightning; power and telephone service impaired.	Do.
Reading and Berks County, Pa.	2	P. m			25,000	Electrical and rain	Barns and sheds burned; highways blocked by broken trees; heavy property damage at Mertztown	
Lebanon, Ind. (6 miles southwest).	3				7,500	Electrical	Barn and contents burned	Do.
Shelbyville, Ind. (2 miles east).	3				20,000	do	A hangar, 4 planes, 3 trucks, and a tractor burned.	Do.
Muskingum and Noble Counties, Ohio.	4	P. m			10,000	Hail	Considerable damage to crops and buildings	Do.
Grand Rapids (near), Mich.	4				25,000	Electrical	Amusement park and church damaged by lightning.	Do.
Port Arthur, Tex	5					Wind and rain squal.	Trees uprooted; tanker broke away from dock causing some damage.	Do.
Atoka, Okla	6	5 p. m	440	1		Wind	Ball park grandstand demolished; roofs torn off; windows broken; wires and trees blown down; path 2 miles long; 4 persons injured.	Do.
Palermo, Me	6	P. m				Probably tornado	Buildings demolished or moved; several persons hurt.	Washington (D. C.) Post.
La Porte, Tex	10	3 p. m				do	Timber and awnings damaged in bay-shore area.	Official, U. S. Weather Bureau.
Cascade and Teton Counties, Mont.	10					Hail	Chief damage to crops	Do.
Dane, Jefferson, Waukesha, Milwaukee, Ozaukee, Door, Brown, and Calumet Counties, Wis.	12	2:30 - 5:30 p. m.			217,000	Wind and thunderstorms.	Wires, poles, trees, and signs blown down; windows broken; barns wrecked.	Do.
Adrian, Mich	12					Rain, hail, and wind.	Light poles, trees, and other property considerably damaged.	Do.
Glacier County, Mont	12					Hail	Crops damaged	Do.
Fayette and Ross Counties, Ohio.	14-17			1		Wind, electrical and rain.	Much damage to property by flooding; several injured and 45 stunned by lightning.	Do.
Canton, N. Y. (vicinity of)	15				10,000	Electrical	Large barn and other buildings burned or damaged.	Do.
Thornburg, Kans. (3 miles southeast).	18	6:30 p. m				Tornado	Number of farm buildings wrecked; path 4 miles long.	Do.
Knoxville (near), Tenn	19	2:50 p. m			8,000	Thunderstorm	Barn and contents burned; farm machinery damaged.	Do.
Hanlontown (near), Iowa	19	7:30 p. m			3,200	Tornado	Buildings damaged; livestock killed; path 5 miles long.	Do.
Clay and Palo Alto Counties, Iowa.	19	P. m			12,000	Wind and rain	Trees, small buildings, windmills and electric wires damaged; some small buildings wrecked.	Do.
Crawford and Humboldt Counties, Iowa.	19					Wind	Roofs and chimneys damaged; corn blown down	Do.
Linn and Sioux Counties, Iowa.	19					Rain and flood	Sewers flooded; railroad washed out; train derailed.	Do.
Buena Vista County, Iowa	20	4-4:10 p.m.	1,760		5,000	Hail	Windows and auto tops pierced; corn injured	Do.
Slaton (near), Tex	20	8:15 p. m	3,520		30,000	Wind	Chief damage to buildings; some crop injury; path 20 miles long.	Do.
Cass and Monona Counties, Iowa.	20				12,000	Wind and hail	Auto tops, roofs and windows pierced; corn injured; electric wires damaged.	Do.
Granisburg, Wis	20					Hail	Crops and trees considerably damaged	Do.
Tama County, Iowa	20					Wind	Awnings and store fronts damaged; small buildings demolished; 20 electric poles blown down.	Do.
Davis County, Iowa	21	3:15-3:30 p. m.	100		400,000	Tornado, wind and hail.	Trees mutilated; houses, barns and windmills wrecked; 600 homes unroofed; overhead wires damaged; 20 persons injured; path 11 miles long.	Do.
Van Buren, Jefferson, Henry, Washington, and Louisa Counties, Iowa.	21	3:30-4:30 p. m.	33-100	2	125,000	Tornado	Damage confined to rural districts; overhead wires damaged; livestock killed; 8 persons injured; path 50 miles long.	Do.
Labette, Cherokee and Crawford Counties, Kans.	21	4:10-4:30 p. m.	880	2	50,000	do	Practically every building at Oswego fair grounds damaged; heavy property damage elsewhere; path 35 miles long.	Do.
Lamar (near), Mo	21	5 p. m	1,760		2,000	Small tornado	Barn, silo and some small sheds blown down	Do.
Poweshiek County, Iowa	21	do			8,000	Wind	Farm buildings and trees damaged; airplane wrecked.	Do.
Scott County, Iowa	21	5:30 p. m			5,000	Hail and wind	Roofs and windows pierced; corn stripped	Do.
Arnett, Okla. (2 miles northwest).	21	7 p. m	200		1,200	Wind	Damage to property other than crops; path 4 miles long.	Do.
Columbia, Mo. (southern part).	21	do	2 blocks		20,000	Small tornado	City and university buildings damaged; 1 person injured.	Do.
Oxfordville (near) to Oconomowoc, Wis.	21	7:30-9 p. m.	200	1	300,000	Possibly 2 tornadoes.	Many farm buildings wrecked; crops ruined; over 40 families reported homeless or in need of aid; 9 persons injured; path 50 miles long.	Do.
Pittsfield, Ill	21				10,000	Wind	Poles and trees blown down; roofs damaged; wire service temporarily cut off.	Do.
Overbrook, Kans., and vicinity.	22	4:10 p. m	1,760		3,000	Tornadic wind	Farm buildings, growing crops and telephone wires damaged; path 2.5 miles long.	Do.
Butler County, Iowa	23	4:30 p. m			4,000	Wind	Several small buildings and roofs damaged; trees uprooted; auto tops torn; 2 persons injured.	Do.